

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An oxalic-modified aluminum hydroxide material having a chemical structure consisting essentially of aluminum hydroxide (Al(OH)_3) and oxalic acid moiety, the material having diffraction peaks determined by x-ray diffraction (XRD) spectrum, having D values of 6.39 Å, 6.16 Å, 4.67 Å, at 2θ angles of 13.836°, 14.347°, and 19.006°, respectively.
2. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)_3 of Claim 1, wherein the intensities of diffraction peaks, where the 2θ angles are 13.836° and 19.006°, are 29.12% and 56.10%, respectively, of the diffraction peak intensity where the 2θ angle is 14.347°.
3. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)_3 of Claim 1, wherein the material ~~oxalic modified~~ Al(OH)_3 has an initial weight loss temperature of 330° to about 380°C, and a rate of weight loss of up to 51% at 600°C.
4. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)_3 of Claim 3, wherein the initial weight loss temperature is about 350° to about 370°C.
5. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)_3 of Claim 1, wherein the mean particle size is less than 300nm.
6. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)_3 of Claim 5 wherein the mean particle size is less than 250 nm.

7. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)₃ of Claim 1 wherein the mean particle size is 300 to about 10 nm.

8. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)₃ of Claim 1 wherein the density is 0.6 g/cm³ to about 1.1 g/cm³, and the loose density is 0.5 g/cm³ to about 0.9 g/cm³.

9. (currently amended) The oxalic-modified aluminum hydroxide material Al(OH)₃ of Claim 1 wherein the density is about 0.74 g/cm³ to about 1.04g/cm³, and the loose density is about 0.54 g/cm³ to about 0.83 g/cm³.

10. (withdrawn) A method of preparing ultrafine modified Al(OH)₃, comprising the steps of:

(A) 1) introducing a CO₂-containing gas and a NaAlO₂ solution into a high gravity rotating bed apparatus (Rotating Packed Beds Reactor(RPBR)), 2) reacting to form a reactant composition in the form of a gel or a liquid suspension, 3) filtering and washing to obtain a particulate Al(OH)₃ filter cake, and 4) optionally drying the filter cake to obtain a powdered product; wherein the gas/liquid volume flow rate is 0.5 to about 10, on the basis of standard pure CO₂, and the concentration of NaAlO₂ is 0.1 to about 10 mol/L; and

(B) 5) mixing the particulate Al(OH)₃ obtained in Step A, with a modifying agent selected from the group consisting of an oxalate, an oxalic acid, or a mixture thereof, 6) reacting for a predetermined period of time at a temperature equal to or higher than 100 °C; and 7) drying the reacted Al(OH)₃ to obtain an ultrafine modified Al(OH)₃ powder product.

11. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 10 wherein the concentration of NaAlO₂ is about 1 to about 8 mol/L.

12. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 10 wherein the reaction temperature in Step B is less than 205°C.

13. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 12 wherein the reaction temperature in Step B is 140-180°C.

14. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 10 wherein the molar ratio of modifying agents in Step B to Al(OH)₃ filter cake or powder from Step A is 0.3 to about 2; and said modifying agents are in the form of a solid or a solution.

15. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 10 wherein the gas/liquid volume rate is 0.1 to about 5 in Step A, on the basis of standard pure CO₂, and the reaction temperature is 20 to about 80°C.

16. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 10 wherein pH value of the reactant composition is controlled to greater than or equal to 8 in Step A.

17. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 16 wherein the pH is 8 to about 13.

18. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 10 wherein the oxalate is selected from a lithium, sodium and potassium oxalate.

19. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 10 wherein the activator and the crystal form controlling agent are added into Step A, into Step B, or both, and the activator is selected from the group consisting of fatty acid and its salt, ester aluminate, and ester titanate, and the crystal form controlling agent is selected from sulfate and phosphate.

20. (withdrawn) A method of preparing ultrafine Al(OH)₃, comprising the steps of: introducing a CO₂-containing gas and a NaAlO₂ solution into a high gravity rotating bed apparatus, reacting and generating a reactant composition comprising a gel or a liquid suspension of Al(OH)₃; filtering and washing the reactant composition to obtain an Al(OH)₃ filter cake, and optionally drying the filter cake to obtain a powdered product; wherein the gas/liquid volume flow rate is 0.5

to about 10, on the basis of standard pure CO₂ and wherein the concentration of NaAlO₂ is 0.1 to about 10 mol/L.

21. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 20 wherein the concentration of NaAlO₂ is about 1 to about 8 mol/L.

22. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 20 wherein the pH value of the reactant composition is greater than or equal to 8.

23. (withdrawn) The method of preparing ultrafine modified Al(OH)₃ of Claim 22 wherein the pH is 8 to about 13.

24. (withdrawn) The ultrafine Al(OH)₃ product prepared by the method of Claim 10.

25. (withdrawn) The ultrafine Al(OH)₃ product of Claim 24, wherein in the method the pH value of the reactant composition is greater than or equal to 8.

26. (currently amended) A fire retardant product comprising a fire retardant material comprising an oxalic-modified aluminum hydroxide material having a chemical structure consisting essentially of aluminum hydroxide (Al(OH)₃) and oxalic acid moiety, material as a fire retardant, the material exalic-modified Al(OH)₃ having diffraction peaks determined by x-ray diffraction (XRD) spectrum, having D values of 6.39 Å, 6.16 Å, 4.67 Å, at 2θ angles of 13.836°, 14.347°, and 19.006°, respectively.

27. (previously presented) The fire retardant product of Claim 26, wherein the intensities of diffraction peaks, where the 2θ angles are 13.836° and 19.006°, are 29.12% and 56.10%, respectively, of the diffraction peak intensity where the 2θ angle is 14.347°.

28. (currently amended) The fire retardant product of Claim 26, wherein the material exalient-modified Al(OH)₃ has an initial weight loss temperature of 330° to about 380°C, and a rate of weight loss of up to 51% at 600°C

29. (previously presented) The fire retardant product of Claim 26, wherein the mean particle size is less than 300nm.

30. (previously presented) The fire retardant product of Claim 26 wherein said the density is 0.6 g/cm³ to about 1.1 g/cm³.